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T O P S E C R E T 092356Z CITE [redacted] 9834 1967 FEB 10 00 28Z 25X1

25X1

CORONA/PET

SUBJ: MSN 1038 PHOTOGRAPHIC EVALUATION INTERIM REPORT (PEIR)

REF: [redacted] 25X1

10 FEB 1967

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1. NUMERICAL SUMMARY

MSN NO AND DATES: 1038-1, 14-19 JANUARY 1967
1038-2, 19-26 JANUARY 1967

LAUNCH DATE AND TIME: 14 JANUARY 1967/2128Z

VEHICLE NO: 1629

CAMERA SYSTEM: J-34

PAN CAMERA NOS: FWD LOOKING 192
AFT LOOKING 193

MSN 1038-1 S/I NO: D93-86-112

MSN 1038-2 S/I NO: D90-111-108

RECOVERY REVS: MSN 1038-1 D81
MSN 1038-2 D193

2. CAMERA SETTINGS

FWD LOOKING: 0.225 INCH SLIT WRATTEN
23A FILTER

AFT LOOKING 0.175 INCH SLIT WRATTEN
21 FILTER

3. PERFORMANCE SUMMARY

A. THE OVERALL IMAGE QUALITY OF MSN 1038-1 AND 1038-2 IS

TOP SECRET

25X1
Excluded from automatic downgrading and declassification

POORER THAN OBSERVED FROM RECENT MISSIONS. DETAILED EXAMINATION OF PANORAMIC MATERIAL FROM EACH MISSION PORTION DID REVEAL ISOLATED INSTANCES OF IMAGE QUALITY THAT WAS COMPARABLE TO RECENT MISSIONS. ANALYSIS OF ATMOSPHERIC CONDITIONS FROM INDEX CAMERA PHOTOGRAPHY SHOWED AN EXCEPTIONALLY LOW PERCENTAGE OF CLEAR TERRAIN AREAS.

B. THE ORIGINAL NEGATIVE FROM MSN 1038-1 WAS PROCESSED [redacted] WHILE MSN 1038-2 WAS PROCESSED [redacted] VISUAL EXAMINATIONS OF ORIGINAL NEGATIVE SHOWED NO DETECTABLE DIFFERENCE BETWEEN THE TWO PORTIONS OF THE MISSION DUE TO PROCESSING. 25X1 25X1

C. [redacted] USES A THREE CONTRAST LEVEL DUPLICATING SYSTEM WHEREAS [redacted] USES A SINGLE LEVEL SYSTEM. IT IS NOTED THAT APPROXIMATELY 15 PERCENT OF MISSION 1038-2 WAS DUPLICATED USING SO-233 WHICH PRODUCES THE LOWEST CONTRAST RESULTS. THE MISSION 1038-2 DUPLICATES CONTAINED MORE PINHOLES THAN MSN 1038-1. THIS PROBLEM IS ATTRIBUTED TO EXCESSIVE DIRT. THE PET GROUP REQUESTS THAT A DETAILED REPORT OF THE DUPLICATION OF MISSION 1038 BE PREPARED BY [redacted] FOR THE NEXT PEIR MEETING. 25X1 25X1 25X1

D. NO CORN TARGETS WERE RECORDED.

E. NO STELLAR MATERIAL WAS AVAILABLE FOR EVALUATION.

4. ANOMALIES

A. RAGGED FORMAT EDGE EXTENDS FROM THE TAKE-UP END OF EACH FRAME TO THE SECOND SHRINKAGE MARKER ALONG THE BINARY EDGE OF THE MATERIAL, ON BOTH CAMERA SYSTEMS ON 1038-1 AND 1038-2.

CAUSE: THE TENDENCY FOR EMULSION SCRAPING IN THIS SYSTEM

WAS NOTED DURING SOME PHASES OF [illegible]P TESTING, AND IS ATTRIBUTED LARGELY TO UNPOLISHED RAILS. FLIGHT SYSTEMS WITH SERIAL NUMBERS LARGER THAN J-36 (MISSION 1035) HAVE POLISHED RAILS, AND BASED ON MATERIAL ANALYSIS FROM THESE FLIGHT SYSTEMS WHICH HAVE FLOWN THERE HAS BEEN A MARKED IMPROVEMENT IN INSTRUMENT CLEANLINESS (PEIR 1035 AND 1037).

ACTION: NONE REQUIRED.

B. DOUBLE EXPOSURES OF THE S/I'S WERE PRESENT ON FRAME 229 (1038-1) AND FRAMES 4 AND 16 (1038-2).

CAUSE: THE PLATEN WAS DOWN FOR BOTH EXPOSURES IN THE CASES OF FRAMES 229 (1038-1) AND 16 (1038-2). THIS WOULD BE INDICATIVE OF A MISSING "PLATEN UP" COMMAND AND ARE EXPLAINABLE BY THE "SWITCH OVER" OF THE S/I CONTROL (1037 PEIR). THE FIRST EXPOSURE OF FRAME 4 (1038-2) WAS TAKEN WITH THE PLATEN UP WHILE THE SECOND EXPOSURE WAS TAKEN WITH THE PLATEN DOWN. THIS IS INDICATIVE OF A MISSING "PLATEN DOWN" COMMAND BUT CANNOT BE EXPLAINED BY THE "SWITCH OVER" THEORY.

ACTION: AN ACTION ITEM WAS INITIATED BY THE 1037 PEIR TO INVESTIGATE TRADE-OFF OF REDESIGN VS SIGNIFICANCE OF "SWITCH OVER" PROBLEM. THIS PROBLEM IS CONSIDERED TO BE OF MINOR SIGNIFICANCE AND DOES NOT WARRANT A REDESIGN. THE PROBLEM ON FRAME 4 (1038-2) IS CONSIDERED TO BE A RANDOM FAILURE (POSSIBLY RELATED TO THE PLATEN SOLENOID) AND THEREFORE NO ACTION IS RECOMMENDED.

C. IMMEDIATELY FOLLOWING A MANUFACTURING SPLICE IN FRAME 72

PASS D 73 OF THE AFT RECORD A VERY FINE PLUS DENSITY LINE APPEARS ABOUT ONE QUARTER INCH INTO THE FORMAT FROM THE CAMERA NUMBER EDGE OF THE MATERIAL.

CAUSE: INSPECTION OF DUPE POSITIVES REVEALED THAT THIS LINE WAS VISIBLE AT SOME DENSITIES ON ALL MATERIAL UNTIL THE NEXT MANUFACTURING SPLICE LOCATED IN FRAME 47 OF PASS D119. THIS APPARENTLY WAS A DEFECT THAT EXISTED IN THE FILM BEFORE EXPOSURE.

ACTION: NONE.

D. A CREASE IN THE MATERIAL WAS NOTED BEGINNING ON FRAME 139 PASS D38 OF THE FORWARD RECORD AND CONTINUES ABOUT HALFWAY THROUGH FRAME 141 WHERE IT LEAVES THE MATERIAL AT THE TIME TRACK EDGE. IT EXTENDS ABOUT ONE QUARTER INCH INTO THE FORMAT. FRAME 142 OF THE SAME PASS CONTAINS A MANUFACTURING SPLICE.

CAUSE: A DEFECT SIMILAR TO THIS HAS BEEN NOTED ON AT LEAST ONE PREVIOUS MISSION. IT IS EXPLAINED BY A MISTRACKING IN THE CAMERA SYSTEM THAT RESULTS FROM A TENSION TRANSIENT CAUSED BY SPLICE ADHESIVE INTERFERING WITH THE REMOVAL OF FILM FROM THE SUPPLY SPOOL.

ACTION: STAY ABREAST OF CHANGES IN SPLICE MANUFACTURING CAPABILITY.

E. VEILED HORIZON IMAGERY WAS NOTED ON THE STARBOARD HORIZON CAMERA PHOTOGRAPHY FROM PASS D05 THROUGH D85 WHERE A GRADUAL CLEARING BEGINS. THE IMAGERY IS CLEAR AT THE END OF THE MISSION.

CAUSE: THE CAUSE IS UNKNOWN. THE HORIZON BOOTS WERE PROPERLY PAINTED AND CHECKED PRIOR TO FLIGHT.

ACTION: CONDUCT FURTHER STUDY (MONITOR: [redacted] 25X1

F. CHARACTERISTIC ANOMALIES - THERE ARE CERTAIN CHARACTERISTIC ANOMALIES WHICH ARE CONSIDERED INHERENT TO THE OPERATION OF THE CORONA SYSTEM. WHILE THESE ITEMS WARRANT ATTENTION TO PREVENT FURTHER DEGRADATION IT IS NOT FELT THAT SPECIFIC ACTION ITEMS SHOULD BE ASSIGNED. A SUMMARY OF THESE ITEMS AND THE DEGREE OF DEGRADATION IS PRESENTED BELOW.

(1) RAIL SCRATCHES ARE MORE SEVERE THAN NORMAL AND CAN BE ATTRIBUTED IN GENERAL TO THE UNPOLISHED RAILS, AND THEIR TENDENCY TO COLLECT A GREATER AMOUNT OF EMULSION PARTICLE BUILD-UP.

(2) DENDRITIC STATIC DISCHARGE - SOMEWHAT GREATER THAN NORMAL.

(3) SCRATCHES WITHIN THE FORMATS OF BOTH PAN CAMERAS CAUSED BY THE SCAN HEAD ROLLERS ARE LESS THAN NORMAL.

(4) INTERMITTENT FINE SCRATCHES PARALLEL TO THE MAJOR AXIS OF BOTH MAIN FILMS ARE LESS THAN NORMAL.

(5) THE FOG PATTERNS EXHIBITED ON BOTH PAN CAMERAS ARE LESS THAN NORMAL.

5. COMMENTS

A. MANY FACTORS INFLUENCE SYSTEM PERFORMANCE. IT IS THE OPINION OF THE PET THAT ATMOSPHERICS WAS THE MAJOR CAUSE OF DEGRADATION OF THE PHOTOGRAPHY. AN ANALYSIS OF THE INDEX PHOTOGRAPHY FROM MISSION 1038 YIELDS THE FOLLOWING INFORMATION.

1038-1

TOTAL INDEX FRAMES 438

CLEAR AND TERRAIN 23 OR 5.3 PERCENT

CLEAR AND SNOW 98 OR 22.4 PERCENT

1038-2

TOTAL INDEX FRAMES 468

CLEAR AND TERRAIN 53 OR 11.3 PERCENT

CLEAR AND SNOW 47 OR 10 PERCENT

ALL OF THE CULTURAL AREAS OBSERVED ON MISSION 1038-1 INDEX PHOTOGRAPHY WERE IN AREAS THAT WERE NOTICEABLY DEGRADED BY ATMOSPHERICS. FROM THIS DATA IT IS OBVIOUS THAT, ON BOTH 1038-1 AND 1038-2, THERE WAS A VERY SMALL PERCENTAGE OF CLEAR TERRAIN PHOTOGRAPHY. FURTHER, OF THE TOTAL CLEAR FRAMES THE MAJORITY WERE AFFECTED BY SNOW. IN ALL PROBABILITY THE GENERAL FEELING OF POOR SYSTEM PERFORMANCE, ON THE PART OF THE PHOTO INTERPRETERS, IS DIRECTLY ATTRIBUTABLE TO THE FACT THAT A SMALL PORITON OF THE TARGETS WERE CLEAR WHEN PHOTOGRAPHED.

B. IT IS NOT IMPOSSIBLE, HOWEVER, THAT OTHER SYSTEM FACTORS ALSO CAUSED PERFORMANCE DEGRADATION. FOR EXAMPLE, TWO FACTORS INFLUENCE LENS PERFORMANCE; FILTERS USED AND IN-FLIGHT TEMPERATURE. THE LENS IS DESIGNED TO BE USED WITH A WRATTEN 21 FILTER. USING THE FWD LOOKING CAMERA WITH A WRATTEN 23A FILTER PRODUCES SLIGHTLY REDUCED LENS PERFORMANCE. IT IS GENERALLY FELT, HOWEVER, THAT THE RESULTING CONTRAST ENHANCEMENT OF THE FWD LOOKING CAMERA IS REQUIRED.

C. PERHAPS THE MOST SIGNIFICANT PONTENTIAL SYSTEM FACTOR IS THE LENS FOCAL PLANE SHIFT WHERE TEMPERATURES VARY FROM NORMAL. ON THIS MISSION, THE CAMERA TEMPERATURES WERE HIGHER

THAN NORMAL ON BOTH MISSIONS, WITH THE 1038-2 BEING CLOSER TO NORMAL. THE SIGNIFICANCE OF THESE SYSTEM FACTORS, HOWEVER, CANNOT BE CLEARLY IDENTIFIED. IT IS IMPORTANT TO NOTE, HOWEVER, THAT IN CERTAIN ISOLATED INSTANCES THE QUALITY OF THE PHOTOGRAPHY APPROACHED THAT OF RECENT MISSIONS. THIS FACT TENDS TO DISCOUNT ANY SIGNIFICANT EFFECT ON IMAGE QUALITY DUE TO ENVIRONMENTAL FACTORS.

T O P S E C R E T

-END OF MESSAGE-